Monitoring and Control Systems (MCS)

Steve Hahn

03/25/2004

- Information Resources
- Control Room Layout
- iFIX Overview
- Basic iFIX Operations
- Monitoring Ace Responsibilities

MCS: Information Resources

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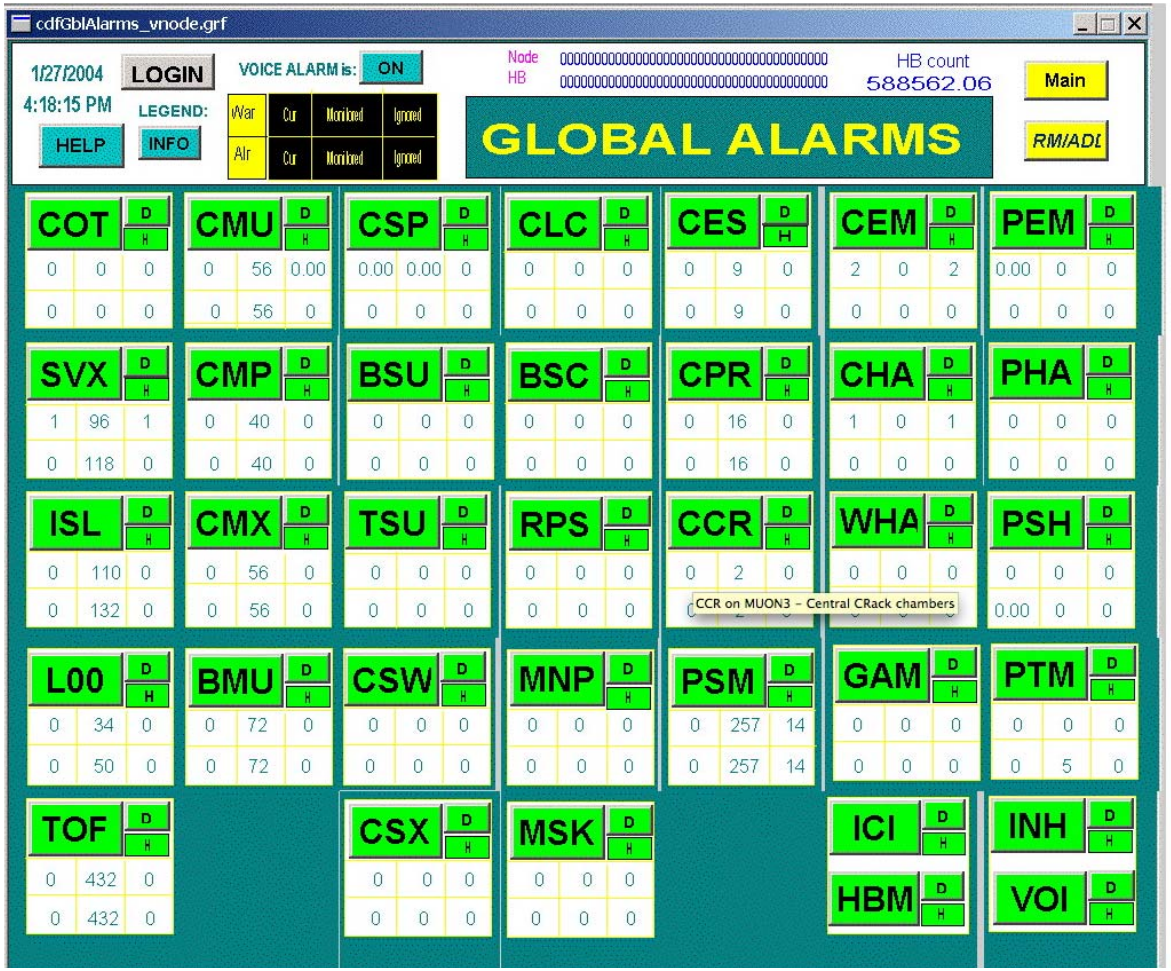
- "iFIX, Detectors info/Recovery" link on Monitoring Ace Help page
  - Links to MCS homepage and tutorials
  - Online displays of iFIX "pictures"
  - Documentation for each detector sub-system:
    - Tutorials
    - Shift instructions
    - Recovery procedures



MCS: Control Room (West wall)

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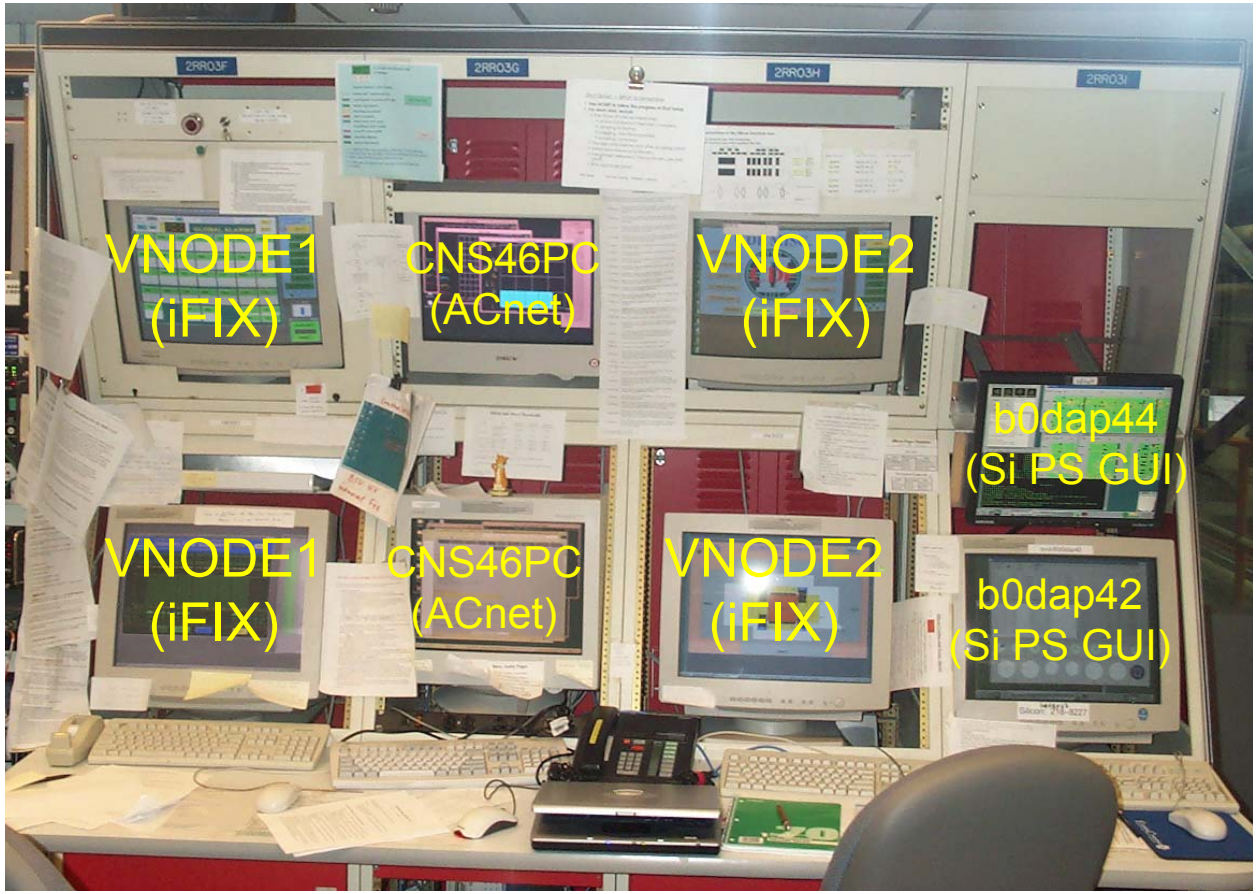
- VNODE1 (Ace iFIX PC)
  - Global alarms
  - HV summary
  - Voice alarms
- CNS46 (Ace Acnet PC)
  - Beam losses
  - Luminosity
  - Downtime logger
- VNODE2 (Public iFIX PC)
  - General monitoring
  - Silicon interlocks
- Silicon PS GUI (Silicon Linux)
  - Power supply monitoring & control



MCS: Control Room (South wall)

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- Safety displays
  - VESDA
  - FENWAL
  - FIRUS
  - Cameras and PELCO controller
  - Solenoid panel
  - Silicon cooling panel
- SOLENOID2 (iFIX)
  - Solenoid view node
  - ICICLE program
- CNS51PC (Public ACnet PC)
  - General use
- COT2 (iFIX)
  - COT HV/current view node
- b0dap01 (Linux)
  - Operations

MCS: iFIX Overview

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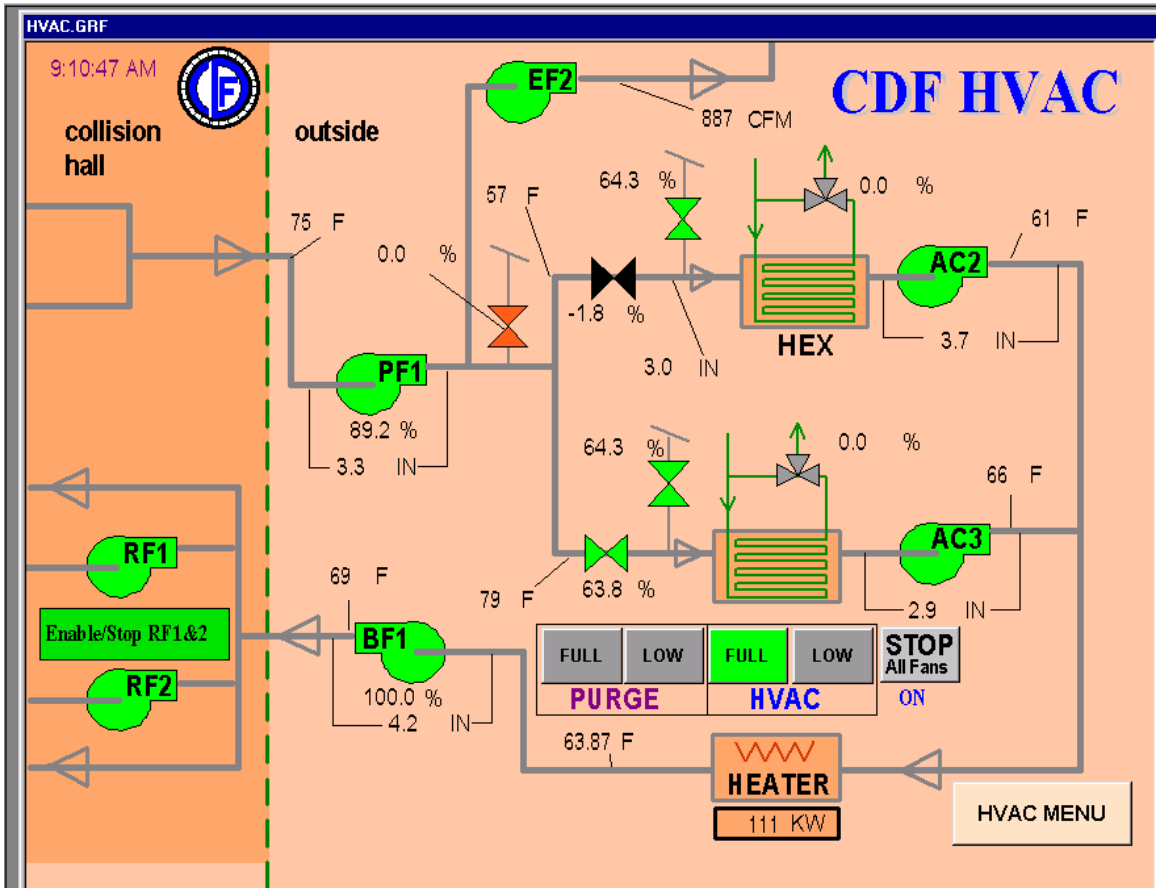
- iFIX (by Intellution bought by INS bought by Emerson bought by GE FANUC)
  - Networked system of PCs running iFIX software and using hardware interfaces to sensors, controllers, and APACS PLCs
  - Presents HUI (OK, GUI) to control and monitor systems
- Makes possible:
  - Monitoring and control of detector and infrastructure systems
  - Basic control during data-taking
  - Expert control and logging at system PCs



Example iFIX "picture" (collision hall HVAC)

MCS: iFIX Overview

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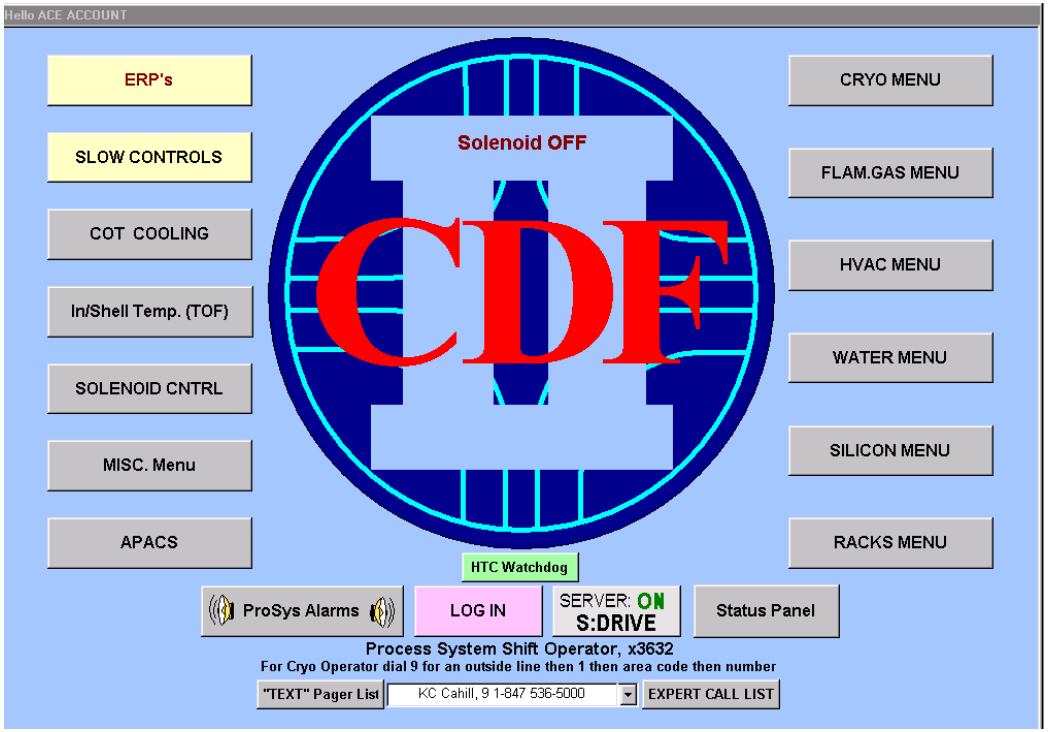
- iFIX "pictures" have links (usually, as buttons) to other "pictures". Any CDF symbols link to the main iFIX page:
- Main iFIX "picture"
  - Shows process system tech currently on duty and their LRP #
  - Displays iFIX status
    - Server should be ON
    - Server disk should be S:DRIVE not a local disk such as C:
- iFIX accounts (not Windows account):
  - VNODE1: always ACE (learn password), some privs like reset power supplies
  - VNODE2: always PUBLIC (no password), for general use (no privs)
- All iFIX "pictures" run within Intellution Dynamics Workspace window
  - Can be restarted from START→Programs →iFIX →Intellution Dynamics Workspace
  - Cannot shutdown iFIX or log out without privileged iFIX account (not ACE)



MCS: Basic iFIX Operations

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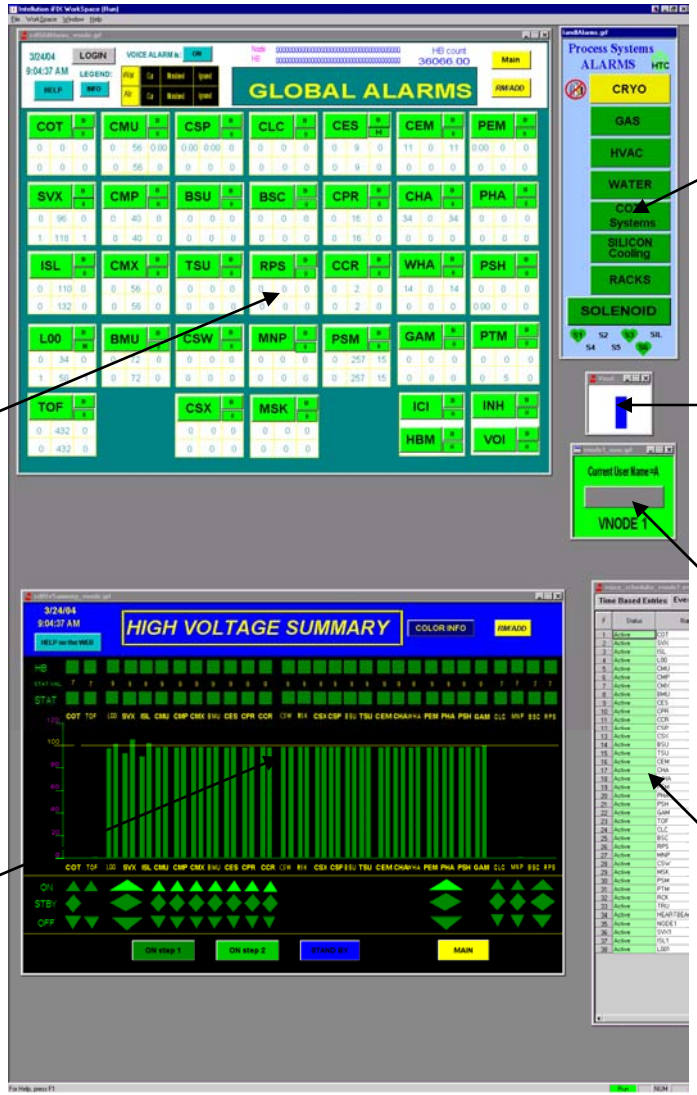
Following "pictures" should always be on VNODE1:

Global Alarms: box red (alarm) or yellow (warning) needs investigation

HV Summary: any bar red (alarm) or yellow (warning) or far from 100% when green needs investigation



Process Systems Alarms: ERP and other important systems show up in red (alarm) or yellow (silenced)

Pinwheel: spins when iFIX is ready for input

Login check: turns red if iFIX account is not correct (ace)

Voice scheduler: looks for conditions and produces audible alarms. Do not close!

MCS: Basic iFIX Operations

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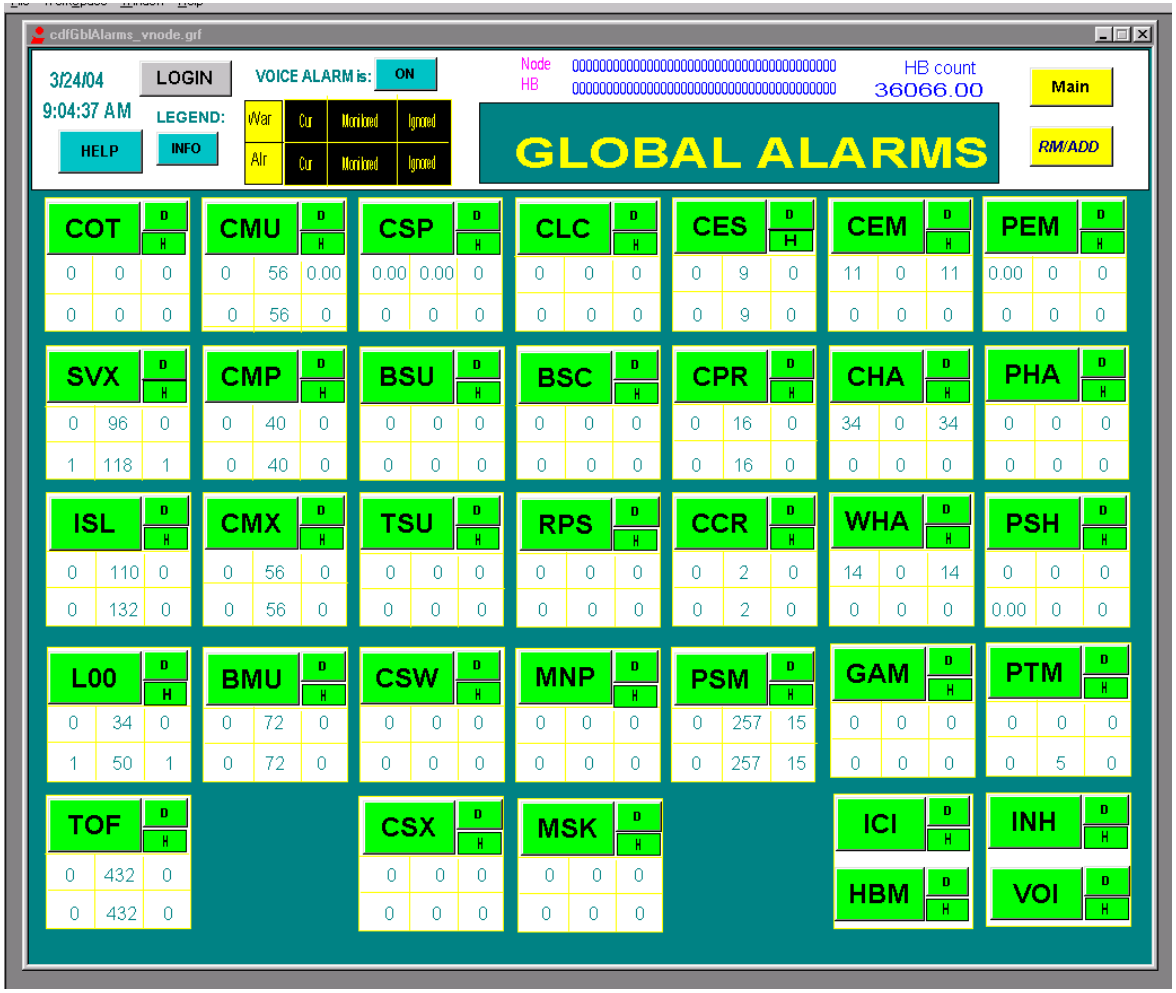
- Global Alarms "picture" summarizes status of detector and power systems
  - Matrix of current, monitored, and ignored warnings and alarms
  - Click on system name to get error history
  - Click on adjacent D button to get detailed information
  - Adjacent H shows heartbeat status (is system PC responding?)
  - See legend INFO button for details on colors



MCS: Basic iFIX Operations

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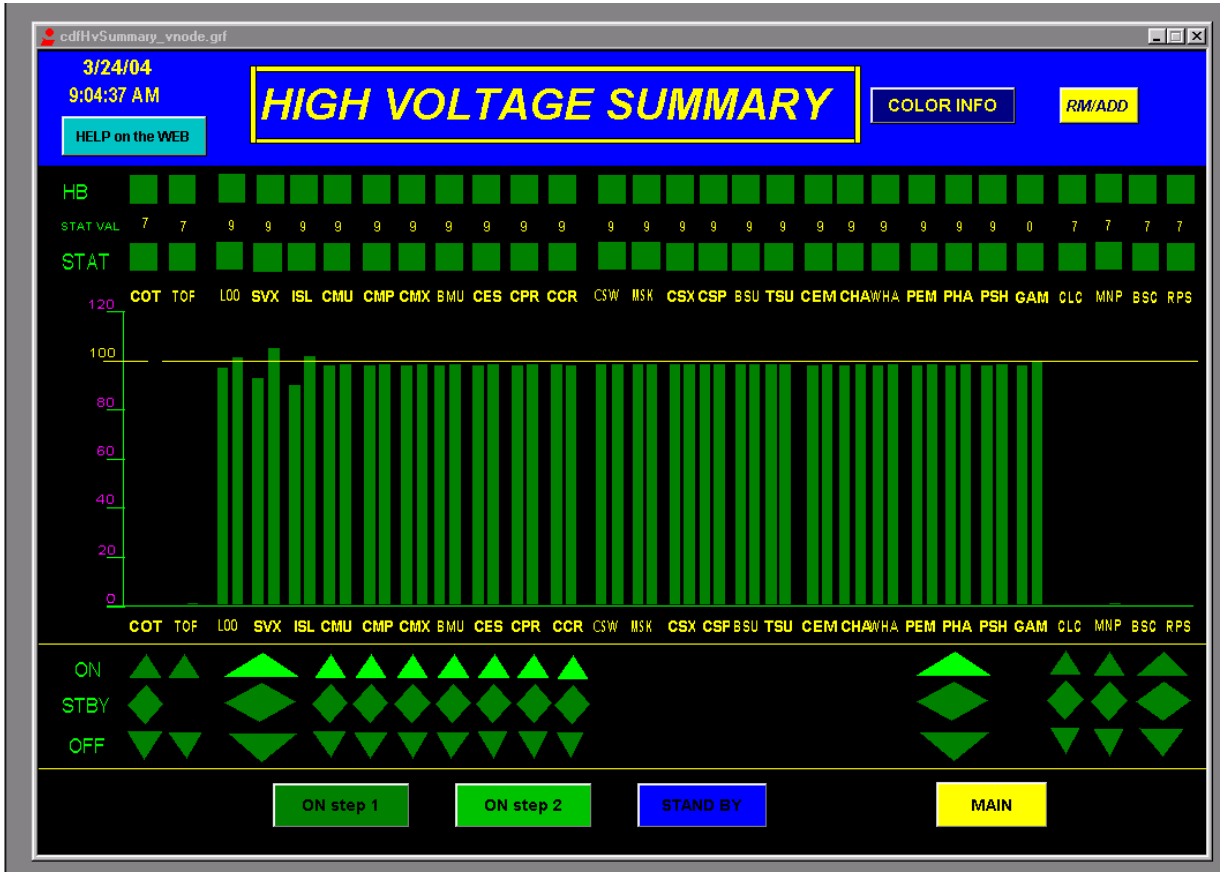
- High Voltage Summary "picture" displays and control HV status for each detector
  - HB row shows heartbeat status (bad—purple)
  - STAT row shows status (green-on, blue-standby, red-tripped)
  - Double bar histogram shows min & max channel for detector in % of correct value
  - Arrows at bottom turn HV on, off, or standby
  - Buttons at bottom allow ON during shot setup, ON for data-taking, and STANDBY for all detectors



MCS: Basic iFIX Operations

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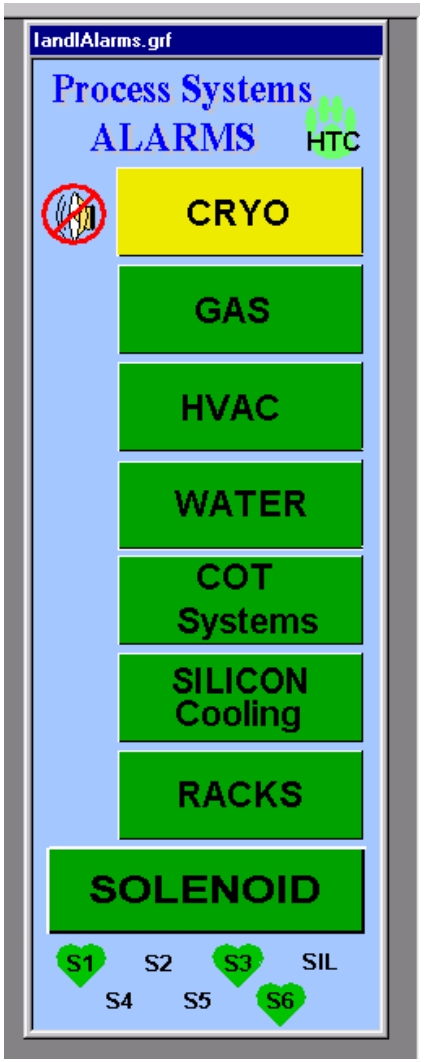
- Process Systems Alarms "picture" summarizes alarm status of important systems
  - Global button for each system brings up "picture" containing list of all devices which may cause alarm in that system (alarm-red, silenced alarm-yellow and "no sound" symbol)
  - Device(s) in alarm show up in red instead of green (silenced will also be indicated)
  - Heartbeat indicators for cryo area computers at bottom
- If there is an audible alarm (even if silenced):
  - Call the cryo tech (X3632) to confirm and find out action being taken
  - Click button to determine device in alarm



MCS: Monitoring Ace Responsibilities

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- Understand all alarm conditions at beginning of shift (consult with previous monitoring ace) and write list in e-log
- Monitor safety systems—FIRUS, VESDA, status panel (please read "Monitoring Ace Knowledge")
- Make sure voltages are in correct state (shot setup checklist):
  - During shot setup
  - In preparation for data-taking after scraping
  - In preparation for end of shot or after beam abort
- If HV trip occurs (red HV summary bars):
  - Click global button to get history of alarms
  - Click adjacent D button to get detailed picture of detector and note in e-log specific location(s) of trips
  - Follow specific MCS help instructions for tripped detector; for most systems, at least once, reset HV by clicking ON arrow on HV summary "picture"
  - Make sure trigger inhibit works correctly

MCS: Monitoring Ace Responsibilities

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- Check process system alarms with process system tech
  - If not understood, may be cause for initiating ERP
- If system shows lost or no heartbeat (adjacent H button grey or purple), notify system expert(s)
- iFIX problems on VNODE1 or VNODE2:
  - If VNODE1 not logged in as ace, login check will turn red. Click on grey button and log out of wrong iFIX account and back in as "ace".
  - If unresponsive or frozen, call iFIX experts:
    - J.C. Yun
    - Steve Hahn
  - Under expert advice, may have to reboot computer by power cycling
- Problems on detector PC may require local actions at that PC
- If ICICLE does not send data to runControl, may need to restart on SOLENOID2
- iFIX crashes are tricky and often not reproducible; the more info written in the e-log, the better